REMARKS

This Amendment responds to the final Office Action mailed on January 20, 2006. In the final Office Action, the Examiner:

- rejected claim 1 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement;
- rejected claims 1-5, 9, 13 and 17 under 35 U.S.C. § 102(b) as being anticipated by Johnson *et al.* (U.S. Patent No. 5,354,788);
- rejected claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Johnson *et al.*; and

Claims 7, 8, 10-12, 14-16 and 18-25 are canceled without prejudice because they were withdrawn from consideration by the Examiner. Claims 1, 2 and 17 are amended to correct typographical errors. Claims 9 and 13 are amended to conform the Markush group language to a proper format. No new matter is added by this Amendment. After entry of this Amendment in response to the instant final Office Action, the pending claims are: claims 1-6, 9, 13 and 17.

Response To Rejection Under 35 U.S.C. 112, First Paragraph

Claim 1 was rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The Examiner asserted that:

(I) the previously added claim recitation of "in the presence of the acid catalyst" in step (b) of claim 1 lacks support in the specification; and

(II) paragraph [24] discloses the claimed species, in that the (g) step at page 11, line 10 does not require the presence of an acid catalyst.

Applicants respectfully submit that the Examiner's assertions are incorrect for the following reasons.

(I) The Newly Added Claim Recitation Of "In The Presence Of The Acid Catalyst" Is Supported Expressly, Implicitly, And Inherently By The Specification

"The proscription against the introduction of new matter in a patent application (35 U.S.C. 132 and 251) serves to prevent an applicant from adding information that goes beyond the subject matter originally filed." See MPEP § 2163(I)(B) citing *In re Rasmussen*, 650 F.2d 1212, 1214, 211 USPQ 323, 326 (CCPA 1981). Therefore, "(w)hile

there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure." See MPEP § 2163(I)(B). Applicants respectfully submit that the previously added claim recitation of "in the presence of the acid catalyst" in step (b) of claim 1 is supported expressly, implicitly, and inherently by the specification for the reasons below.

A. The Recitation of "In The Presence Of The Acid Catalyst" Is Supported Expressly By The Specification.

The claim recitation of "in the presence of the acid catalyst" in step (b) of claim 1 is supported expressly by the specification, for example, in the first sentence of paragraph [29] which expressly recites that **"(t)he alkylation and novolak formation reactions can be effectively carried out in the presence of an acid catalyst."** The method of claim 1 comprises step (a) and step (b). The specification clearly indicates that step (a) of claim 1 is the alkylation formation reaction and step (b) of claim 1 is the novolak formation reaction. See the paragraphs below. In the other words, paragraph [29] expressly supports that the novolak formation reaction [*i.e.*, step (b) of claim 1] can be carried out in the presence of an acid catalyst.

The details of the alkylation formation reaction is particularly pointed out in the specification, for example, in paragraphs [25] to [27], as shown below.

> [25] Generally, the reaction of an **unsaturated alcohol** with a resorcinol compound may be carried out in the presence of an acid catalyst at 125 °C to 150 °C temperature conditions. The reaction is done in such way that all the unsaturated alcohol is completely reacted with the phenolic compound producing a mixture comprising alkyl chain bridged resorcinols and also alkyl and alkyl ether bridged resorcinols. The formation of alkyl and alkyl ether bridged resorcinols are expected to show flexibility and lower the solubility parameter of the resulting material. When the resorcinol to dihydroxy-2-butene is 1:0.2 mole, about 10 mole percent of ether and alkyl bridged resorcinol structure is produced from the reaction. After the completion of reaction, the alkylated products from dihydroxy-2-butene contain three resoinolic groups per alkyl chain. The molar ratios of resorcinol to unsaturated alcohol can be varied between 0.1 to 0.4 mole of alcohol per mole resorcinol and preferably 0.15 to 0.25 mole of an unsaturated alcohol.

[26] For the preparation of flexibilized resorcinolic resins using an **unsaturated aldehyde**, preferred compounds include, but are not limited to, crotonaldehyde, acrolein and methacrolein. They are used at a molar ratio of about 0.1 to 0.35 mole of unsaturated aldehyde per mole of resorcinol. The reaction is preferably carried out in the presence of an acid catalyst to make use of both the aldehyde and double bond in the alkylation reaction with resorcinol. The reaction products typically comprises alkyl chain bridged resorcinols containing three resorcinol groups in the molecule.

[27] Similarly, for the preparation of a flexibilized resorcinol resin using a **dialdehyde**, preferred compounds are malonaldehyde, succinaldehyde, glutaraldehyde, adipaldehyde, or a mixture thereof. They are used at a molar ratio of about 0.05 to 0.15 mole of dialdehyde per mole of resorcinol. After the reaction, the alkyl chain typically contains three bridged resorcinol groups.

The details of the novolak formation reaction is particularly pointed out in the specification, for example, in paragraph [28], as shown below.

[28] After the alkylation reaction, the alkylated resorcinol products are subsequently used, without isolation and containing unreacted resorcinol, to make the novolak resins by reacting with an aldehyde, preferably formaldehyde. In order to enhance the water solubility, the aldehydes containing from 1 to 6 carbon atoms are preferred that include formaldehyde, acetaldehyde, propionaldehyde, n-butyraldehyde, and n-valeraldehyde. The introduction of more alkyl groups by using these longer alkyl chain aldehydes are also expected to lower the solubility parameter close to that of polyester. In this way, the compatibility is further enhanced and therefore expected to perform better than the conventional resorcinol-formaldehyde resin for PET adhesion.

B. The Recitation of "In The Presence Of The Acid Catalyst" Is Also Supported Implicitly By The Specification.

The claim recitation of "in the presence of the acid catalyst" in step (b) of claim 1 is also supported implicitly by the specification, for example, in Examples 1-7.

Example 1 in paragraph [42] describes an embodiment of the method of making a flexibilized resorcinolic resin solution, comprising: (a) contacting 2 moles of resorcinol with 0.4 moles of 1,4-dihydroxy-2-butene in the presence of 4.0 g of p-toluene sulfonic acid catalyst to form a reaction mixture; and (b) contacting the reaction mixture with 0.76 moles of formaldehyde. After the completion of step (b) of Example 1, the pH of the reaction mixture was then lowered with 15 g of 50% sodium hydroxide solution to 7.8. Therefore, Example 1 implicitly supports that step (b) of claim 1 occurs in the presence of an acid because only after a relatively large quantity of sodium hydroxide was added after step (b), the acidic reaction mixture was changed merely to slightly basic (*i.e.*, pH = 7.8). Further, Example 1 implicitly and inherently supports that step (b) of claim 1 occurs in the presence of the p-toluene sulfonic acid catalyst because the catalyst was not neutralized or destroyed before the completion of step (b) of Example 1.

Example 2 in paragraph [45] describes another embodiment of the method of making a flexibilized resorcinolic resin solution, comprising: (a) contacting 2 moles of resorcinol with 0.4 moles of allyl alcohol in the presence of 4.0 g of p-toluene sulfonic acid catalyst to form a reaction mixture; and (b) contacting the reaction mixture with 0.76 moles of formaldehyde. After the completion of step (b) of Example 2, the pH of the reaction mixture was then lowered with 2 g of 50% sodium hydroxide solution to 5.1. Therefore, Example 2 implicitly supports that step (b) of claim 1 occurs in the presence of an acid because even after a relatively large quantity of sodium hydroxide was added after step (b), Example 2 still remains acidic (*i.e.*, pH = 5.1). Further, Example 2 implicitly and inherently supports that step (b) of claim 1 occurs in the presence of the p-toluene sulfonic acid catalyst because the catalyst was not neutralized or destroyed before the completion of step (b) of Example 2.

Example 3 in paragraph [48] describes another embodiment of the method of making a flexibilized resorcinolic resin solution, comprising: (a) contacting 2 moles of resorcinol with 0.5 moles of crotonaldehyde in the presence of 4.0 g of p-toluene sulfonic acid catalyst to form a reaction mixture; and (b) contacting the reaction mixture with 0.70 moles of formaldehyde. After the completion of step (b) of Example 3, the pH of the reaction mixture was then lowered with 6 g of 50% sodium hydroxide solution to 6.9. Therefore, Example 3 implicitly supports that step (b) of claim 1 occurs in the presence of an acid because even after a relatively large quantity of sodium hydroxide was added after step (b), Example 3 still remained slightly acidic (*i.e.*, pH = 6.9). Further, Example 3 implicitly

and inherently supports that step (b) of claim 1 occurs in the presence of the p-toluene sulfonic acid catalyst because the catalyst was not neutralized or destroyed before the completion of step (b) of Example 3.

Example 4 in paragraph [51] describes another embodiment of the method of making a flexibilized resorcinolic resin solution, comprising: (a) contacting 2 moles of resorcinol with 0.4 moles of crotonaldehyde in the presence of 4.0 g of p-toluene sulfonic acid catalyst to form a reaction mixture; and (b) contacting the reaction mixture with 0.76 moles of formaldehyde. After the completion of step (b) of Example 4, the pH of the reaction mixture was then lowered with 4 g of 50% sodium hydroxide solution to 6.4. Therefore, Example 4 implicitly supports that step (b) of claim 1 occurs in the presence of an acid because even after a relatively large quantity of sodium hydroxide was added after step (b), Example 4 still remained acidic (*i.e.*, pH = 6.4). Further, Example 4 implicitly and inherently supports that step (b) of claim 1 occurs in the presence of the p-toluene sulfonic acid catalyst because the catalyst was not neutralized or destroyed before the completion of step (b) of Example 4.

Example 5 in paragraph [53] describes another embodiment of the method of making a flexibilized resorcinolic resin solution, comprising: (a) contacting 2 moles of resorcinol with 0.3 moles of crotonaldehyde in the presence of 4.0 g of p-toluene sulfonic acid catalyst to form a reaction mixture; and (b) contacting the reaction mixture with 0.76 moles of formaldehyde. After the completion of step (b) of Example 5, the pH of the reaction mixture was then lowered with 2 g of 50% sodium hydroxide solution to 5.1. Therefore, Example 5 implicitly supports that step (b) of claim 1 occurs in the presence of an acid because even after a relatively large quantity of sodium hydroxide was added after step (b), Example 5 still remained acidic (*i.e.*, pH = 5.1). Further, Example 5 implicitly and inherently supports that step (b) of claim 1 occurs in the presence of the p-toluene sulfonic acid catalyst because the catalyst was not neutralized or destroyed before the completion of step (b) of Example 5.

Example 6 in paragraph [55] describes another embodiment of the method of making a flexibilized resorcinolic resin solution, comprising: (a) contacting 2 moles of resorcinol with 0.2 moles of glutaraldehyde in the presence of 4.0 g of p-toluene sulfonic acid catalyst to form a reaction mixture; and (b) contacting the reaction mixture with 0.76 moles of formaldehyde. After the completion of step (b) of Example 6, the pH of the reaction mixture was then lowered with 2 g of 50% sodium hydroxide solution to 5.0.

Therefore, Example 6 implicitly supports that step (b) of claim 1 occurs in the presence of an acid because even after a relatively large quantity of sodium hydroxide was added after step (b), Example 6 still remained acidic (*i.e.*, pH = 5.0). Further, Example 6 implicitly and inherently supports that step (b) of claim 1 occurs in the presence of the p-toluene sulfonic acid catalyst because the catalyst was not neutralized or destroyed before the completion of step (b) of Example 6.

Example 7 in paragraph [58] describes another embodiment of the method of making a flexibilized resorcinolic resin solution, comprising: (a) contacting 2 moles of resorcinol with 0.3 moles of glutaraldehyde in the presence of 4.0 g of p-toluene sulfonic acid catalyst to form a reaction mixture; and (b) contacting the reaction mixture with 0.76 moles of formaldehyde. After the completion of step (b) of Example 7, the pH of the reaction mixture was then lowered with 4 g of 50% sodium hydroxide solution to 6.4. Therefore, Example 7 implicitly supports that step (b) of claim 1 occurs in the presence of an acid because even after a relatively large quantity of sodium hydroxide was added after step (b), Example 7 still remained acidic (*i.e.*, pH = 6.4). Further, Example 7 implicitly and inherently supports that step (b) of claim 1 occurs in the presence of the p-toluene sulfonic acid catalyst because the catalyst was not neutralized or destroyed before the completion of step (b) of Example 7.

For the above reasons, Examples 1-7 clearly support implicitly the claim recitation of "in the presence of the acid catalyst" in step (b) of claim 1.

C. The Recitation of "In The Presence Of The Acid Catalyst" Is Further Supported Inherently By The Specification.

The claim recitation of "in the presence of the acid catalyst" in step (b) of claim 1 is further supported inherently by the specification, for example, in paragraph [9]. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." See MPEP § 2163.07(a) citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

Paragraph [9], as shown below, makes absolutely clear that the acid catalyst in step (a) of claim 1 must be present in step (b) of claim 1 because the acid catalyst is not neutralized or destroyed before the completion of step (b). Further, it would be so recognized by persons of ordinary skill that the same acid catalyst must remain in the

reaction mixture for the next step, *i.e.*, step (b), because they recognize that a catalyst, by definition or implicitly, does not react with the reactants.

> [9] Embodiments of the invention meet the above need in one or more of the following aspects. In one aspect, the invention relates to an adhesive composition made from a flexibilized resorcinolic resin for polyester fiber materials. The flexibilized resorcinolic resin can be made by a method which comprises (a) contacting one or more phenolic compounds with (i) an unsaturated dihydroxy compound, (ii) an unsaturated aliphatic aldehyde compound, (iii) an aliphatic dialdehyde compound, (iv) or a mixture thereof in the presence of an acid catalyst to obtain a reaction mixture; (b) contacting the reaction mixture with an aldehyde which is different from the unsaturated aldehyde and the aliphatic dialdehyde.

(II) Step (g) in paragraph [24] may still require the presence of an acid catalyst.

Although Applicants recognize that whether paragraph [24] may still require the presence of an acid catalyst is irrelevant to the written description analysis, Applicants still would like to point out the Examiner's assertion that the (g) step at page 11, line 10 does not require the presence of an acid catalyst is wrong for the following reasons.

First, the first sentence of paragraph [24] indicates that the paragraph presents only some embodiments of the invention and therefore, cannot be used to limit the scope of claim 1. Further, the (g) step in paragraph [24] recites that "**adjusting the pH with sodium hydroxide solution to a range from about 6 to about 12.**" Within this pH range, the pH can still be acidic, for example, at about 6. Since the pH adjustment is done by neutralization with sodium hydroxide, when the pH is about 6, *i.e.*, acidic, a part of the acid catalyst recited in step (a) still remains and can arguably act as the acid catalyst for next step, *i.e.*, step (b).

In view of the above comments, claim 1 is clearly supported expressly, implicitly and inherently by the specification, for example, in paragraphs [9], [25]-[29], and Examples 1-7. Therefore, Applicants respectfully request withdrawal of the rejection of claim 1 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Response to Rejections Under 35 U.S.C. § 102(b)

Claims 1-5, 9, 13 and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Johnson *et al.* (U.S. Patent No. 5,354,788). The Examiner indicated that (1) Johnson *et al.* discloses a process for preparing phenolic resole resin comprising the steps of (a) reacting from about 0.05 to about 0.3 moles of a dialdehyde per mole of phenolic compound under acid conditions, and (b) subsequently reacting the products of step (a) with from about 0.4 mole to about 2.8 moles of formaldehyde.

The Applicants respectfully submit that Johnson *et al.* teaches that step (b) is performed under basic conditions. See Col. 2, lines 62-63 of U.S. Patent No. 5,354,788. Please note that claim 1 recites "in the presence of the acid catalyst" in step (b). Therefore, claim 1 is not anticipated by Johnson *et al.* because Johnson *et al.* does not disclose all elements of claim 1, particularly the presence of an acid catalyst in step (b). Because claims 2-5 and 9, 13 and 17 depend on claim 1, they are also not anticipated by Johnson *et al.* as well.

In view of the above comments, Applicants respectfully request withdrawal of the rejections of claims 1-5, 9, 13 and 17 under 35 U.S.C. 102(b) as being anticipated by Johnson *et al.* (U.S. Patent No. 5,354,788).

Response to Rejections Under 35 U.S.C. § 103(a)

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson *et al.* (U.S. Patent No. 5,354,788). The Examiner indicated that Johnson *et al.* discloses a process for preparing phenolic resole resin as stated above. The Examiner has admitted that Johnson *et al.* does not disclose the claimed temperature range of between about 120 °C and about 150 °C. However, the Examiner asserted that because Johnson *et al.* discloses the temperature range of from about 95-105 °C, it would have been obvious to one of ordinary skill in the art to raise the temperature range from about 95-105 °C to about 120-150 °C.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453,1457-58 (Fed. Cir. 1998). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally,

the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness because (1) Johnson *et al.* fails to teach or suggest all the claim elements of claim 6 and (2) Johnson *et al.* teaches away from the invention.

Claim 6 depends on claim 1. Please note that claim 1 recites "in the presence of the acid catalyst" in step (b). Applicants respectfully submit that Johnson *et al.* does not teach or suggest all the claim elements of claim 1, particularly the presence of an acid catalyst in step (b) and the claimed temperature range of "between about 120 °C and about 150 °C."

Further, Johnson *et al.* teaches away from the invention because Johnson *et al.* teaches that step (b) is performed under basic conditions whereas step (b) of claim 1 occurs under acidic conditions. Therefore, claim 1 and thus claim 6, which depends on claim 1, are not obvious over Johnson *et al.*

In view of the above comments, Applicants respectfully request withdrawal of the rejection of claim 6 under 35 U.S.C. 103(a) as being unpatentable over Johnson *et al.* (U.S. Patent No. 5,354,788).

CONCLUSION

In light of the above amendments and remarks, the Applicants respectfully request that the Examiner reconsider this application with a view towards allowance.

No fee is believed due for this submission. However, if any fees are required for the entry of this paper or to avoid abandonment of this application, please charge the required fees to Jones Day Deposit Account No. 50-3013.

The Examiner is invited to call the undersigned attorney at 858-314-1123, if a telephone call could help resolve any remaining items.

Respectfully submitted,

Date January 26, 2005

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